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For confidential circulation to plant pathologists in Australia.

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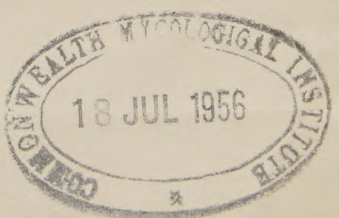

PLANT DISEASE NOTES.

FIELD AND FODDER CROPS.

APHID TRANSMISSION OF A SUBTERRANEAN CLOVER DISEASE:

Results of investigations concerning the subterranean clover disease so widespread in N.S.W. during the autumn of 1955 show that it is transmitted mainly by the black aphid, Aphis craccavora Koch. In experiments carried out in the insectary and glasshouses of the virus section of the Division of Entomology, C.S.I.R.O. at Canberra, A. craccavora transmitted the disease to a high percentage of clover plants. There was evidence that the disease persists in this vector. A low percentage of transmission was effected by Myzus persicae Sulz., the green peach aphid, hence this species is probably an additional vector in the field.

No evidence was obtained to show that the disease is transmitted through the seed; in fact, the results of experiments suggest that the disease is not transmitted by this means.

The disease is not related to the rugose leaf curl virus disease transmitted by the leafhopper Austroagallia torrida Evans, but it is possible that the field picture is confused by the effects of insect toxins and probably by mild symptoms of the leafhopper transmitted lucerne witches' broom disease on clovers.

A preliminary note giving more details of the glasshouse experiments is in press and will be published soon in Volume 22 of the Journal of the Australian Institute of Agricultural Science. Further work is in progress.

- N.E. GRYLLS.

C.S.I.R.O.

Canberra.

UROPHLYCTIS sp. ON PASTURE LEGUMES IN VICTORIA:

In 1952, C.C. Brittlebank recorded Urophlyctus alfalfae Magnus on lucerne, grown at Warrnambool by Mr. T. A. Brittlebank.

The evidence available at that time indicated that this disease was introduced from America on lucerne hay, which was imported for stock feeding purposes during the drought of 1914.

A few diseased lucerne plants were first noticed during the 1917-18 season, but from 1920-22, infection became so severe that the crop was a complete failure.

After taking appropriate eradication measures, this disease-outbreak was successfully suppressed and no further occurrence of U. alfalfae in Victoria has been noted.

In November 1951, however, a specimen of subterranean clover, exhibiting gall-formation on the leaves and developing flowers, was collected at Westmere, in Western Victoria, by Dr. C. R. Millikan. Although this specimen was contributed to the Biology Branch Herbarium at the time of collection, the pathogen was not identified until 1955, when several examples of the same disease on subterranean clover, were submitted for diagnosis, from various parts of Victoria.

Between October and December 1955, infected clover specimens came from Casterton in the Western District, as well as from drier areas in the north and north-east of the State, at Kaniva, Dooen and Burramine East.

Galls from all specimens, including the one from Westmere, were sectioned, and these were found to contain (i) a mass of brown thick-walled resting spores measuring 32-44 /u diameter (ii) a hyaline rhizo-mycelium, characteristic of the genus Urophlyctis.

The pathogen present on subterranean clover (varieties Mt. Barker and Clare) in Victoria may be identified as Urophlyctis sp., but in view of the close morphological similarity between U. alfalfae and U. trifolii (Pass.) Magn. no attempt has been made to determine the species.

- EILEEN E. FISHER

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ROOT ROT OF LUCERNE:

Thinning out of stands is a common feature of many comparatively young lucerne areas in southern Queensland. Investigation into this problem has revealed the presence of various crown rots. In some cases a root rot usually affecting the main tap root 2-4" below the surface of the soil has been found. Phytophthora cryptogea has been isolated from these lesions and pathogenicity tests have shown it responsible for the trouble. This disease has previously been recorded in the U.S.A. (Phytopathology 44:12:700-704, 1954). In Queensland the soil type in affected areas is rather heavy and inclined to remain wet for relatively long periods.

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ANTHRACNOSE ON BURR MEDIC:

During the winter of 1955, anthracnose was found affecting Medicago denticulata at Gatton. The organism agrees in cultural characteristics and spore measurements with Colletotrichum trifolii and has been tentatively identified as such. Only an occasional plant was found affected.

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BLUE MOULD OF TOBACCO:

Reports from the U.S.A. state that blue mould of tobacco seedlings can be effectively controlled with ferbam and zineb. Clayton and Grosso (P.D.R. 38: 771-773, 1954) report "perfect blue mould control" with zineb dusts and sprays. Grosso (P.D.R. 38: 333, 1954) tested a number of antibiotics and reported that streptomycin sulphate at 0.02% and 0.01% solutions were far superior to the dithane-treated checks.

In experiments in the glasshouse at Canberra, zineb was used as a spray at the rate of 3 lb. per 100 gallons and streptomycin sulphate at 0.02%, on seedlings grown in flats. Each flat was divided into three parts, one of which was untreated.

In the first experiment the seedlings were sprayed at 4 p.m. on the first day and 10 a.m. on the second. At 4.30 p.m. of the second day all seedlings were inoculated with a water suspension of conidia. Spray treatments were repeated on the third, seventh and eighth days. After a further 15 days the seedlings were rated for severity of disease. Temperatures during the period of the experiment varied from minimum readings of 50°-64°F to maximum readings of 80°-90°F.

The second experiment was similar to the first. Spray treatments were given on three successive days and then the plants were inoculated with a suspension of conidia. They were spray treated again on days 6,8,13,14, and 15 then rated for disease on day 17. Temperatures during the 17 days of the experiment ranged from minima of 56°-66°F to maxima of 80°-100°F.

At the conclusion of the spray treatment test of experiment 2, the plants were subjected to benzol vapour treatment for 8 consecutive nights, the quantity of benzol used each night being sufficient to prevent infection of healthy plants. Benzol vapour prevented further fructification but did not prevent death of seedlings severely attacked by blue mould.

Results for the three replicates of each of the three treatments are shown in the table. Under the conditions of these experiments the fungicidal value of streptomycin is very low.

Control obtained with zineb is more apparent than real as was evident in the development of stem necrosis in apparently healthy plants when subjected to benzol vapour.

In experiments in Australia, unprotected check plants are almost invariably a complete loss but this occurrence is seldom reported from the U.S.A. There is a marked difference in severity of attack in the two countries and consequently methods of control used in one country may not be as effective and/or the most economical, in the other.

SPRAY TREATMENTS OF TOBACCO SEEDLINGS:

Treatment	Disease rating																		
	Experiment 1.						Experiment 2.												
							Before benzol						After benzol (x)						
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	
Zineb	-	-	2	7	7	4	3	12	-	-	-	-	-	13	2	-	-	-	
	-	2	8	2	3	-	5	10	-	-	-	-	-	12	-	-	2	1	
	-	2	7	6	-	-	6	11	2	1	-	-	-	-	11	-	4	5	(x)
	-	4	17	15	10	4	14	33	2	1	-	-	-	25	13	-	6	6	
Streptomycin	-	-	-	6	4	5	-	-	6	12	1	1	-	7	-	-	1	12	
	-	-	-	7	8	5	-	-	4	6	4	1	-	5		-	5	5	
	-	-	-	7	2	6	-	-	2	7	4	2	-	-	1	-	1	13	(x)
	-	-	-	20	14	16	-	-	12	25	9	4	-	12	1	-	7	30	
Untreated	-	-	-	3	2	10	-	-	-	3	13	4	-	1	-	-	2	17	
	-	-	-	3	4	8	-	-	-	4	6	10	-	2	-	-	2	16	
	-	-	-	3	3	14	-	-	3	3	5	4	-	-	-	-	3	12	(x)
	-	-	-	9	9	32	-	-	3	10	24	18	-	3	-	-	7	45	

(x) Benzol was not used on one replicate in each treatment. No fructification occurred on benzol treated plants.

Disease ratings.

0 = Apparently healthy.

1 = Stem infected at the base and fructification on lower leaves.

2 = As above plus fructification on all leaves.

3 = As above plus plants chlorotic.

4 = Whole stem infected, growing point distorted, and plants stunted.

5 = Plants killed by the disease.

- M. MAIDRYK.

C.S.I.R.O.

Canberra.

VERTICILLIUM WILT OF SAFFLOWER:

Recently at Mondure in the South Burnett, a serious wilt disease occurred in safflower, Carthamus tinctorius. In a 5 acre block approximately 10% of the plants were affected. Symptoms of the disease are a yellowing of the lower leaves followed by rapid wilting. Brown vascular discclouration is obvious and from this diseased tissue a species of Verticillium has been isolated.

In sunflowers adjacent to the safflower block occasional plants were found wilting also. A species of Verticillium identical in cultural characteristics with that obtained from safflower was isolated from these.

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FRUIT.

FLOOD AND PHYTOPHTHORA DAMAGE TO CITRUS IN THE WINDSOR AND RICHMOND AREAS:

During February and March two high floods within a fortnight, a number of minor floodings and almost continuous rain for a period of 6 weeks occurred in the Hawkesbury Valley. This area had suffered severely in the 1949-52 seasons and over 100,000 citrus trees had been destroyed. New plantings had gone on since then and 36,000 acres of young trees, almost all on trifoliata stock had been established and were in a flourishing condition at the time of the recent flooding. Much of this has now been destroyed, some by scouring, some overwhelmed by mud and debris, but most by Phytophthora citrophthora attacking foliage and branches. All trees which were under water for more than 24 hours lost all leaves and fruit due to Phytophthora attack and branch infection, facilitated by the subsequent wet weather, has been continuous. Some trees in lower areas have been standing in water for over 4 weeks. It is presumed that following the first flood zoospore formation on the waterlogged soil surfaces was intense and that the second flood, which, though not as high as the first, caused more damage, was loaded with infective material. The damage has been greatest in backwaters.

It is noteworthy that citrus trees in the Narromine district which last summer were submerged by the waters of the Macquarie River for up to 6 days suffered little or no Phytophthora damage to foliage and branches. These flood waters passing through pastoral country before reaching the orchard area would not be contaminated by Phytophthora.

-LILIAN R. FRASER.

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Sydney.

HEAT THERAPY AND CITRUS VIRUSES:

A heat therapy cabinet similar to that developed at Rothamstead by Kassanis has been in use in Sydney for the last few months. Amongst plants which have been subjected to heat treatment have been a number of young citrus affected with various virus diseases. These are withstanding the continuous heat without injury and have made growth in the cabinet. Treatment for 10 weeks at 36°C failed both to eliminate stem pitting and tristeza viruses from infected orange seedlings and to prevent the invasion of the new growth made subsequent to the commencement of the treatment.

- LILIAN R. FRASER

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ORNAMENTALS.

ROOT AND COLLAR ROTS OF ORNAMENTALS:

In the Sydney Metropolitan area January and February 1956 were months of constant wet weather and high temperatures, providing an almost ideal environment for the development of many collar and root rots.

Aster, honesty, and chrysanthemum plants in particular were severely affected by Phytophthora root rot and this disease apparently caused by Phytophthora cryptogea was recorded for the first time on the following hosts:- dimorphotheca, penstemon, Prostanthera lasianthos, dahlia, foxglove, stock, weigelia, marguerite and aquilegia.

- VIVLEIGH JOHNSON

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MISCELLANEOUS PLANTS:

PHYTOPHTHORA CINNAMOMI ATTACKING NATIVE PLANTS:

During the constant wet weather of summer and autumn quite large numbers of native plants in undisturbed bushland round Sydney succumbed to root rot. In all cases investigated this was found to be caused by Phytophthora cinnamomi. A similar phenomenon was observed during the wet seasons of 1949-1952. Species affected were all low woody shrubs and included Woollsia pungens and Epacris purpurascens (Epacridaceae), Xanthosia tridentata, Actinotus helianthi and Trachymene linearis (Umbelliferae), Dodonaea triquetra (Sapindaceae), Petrophila pulchella (Proteaceae) and Pultenaea spp. (Leguminosae). This fungus is now evidently widespread in the central coast of New South Wales.

- LILIAN R. FRASER.

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BROAD BEAN WILT VIRUS:

This virus was isolated during the past year from a number of previously unrecorded hosts, mostly in the Sydney Metropolitan area. These include herbaceous and woody species in a number of different families as follows: Exochorda grandiflora (Pearl bush), Syringa vulgaris (lilac), Digitalis purpurea (Foxglove), Vicia atropurpurea (vetch), Dianthus sp, Anchusa italica, Gladiolus, Ranunculus, Shirley poppy, Cosmos, Lilium longiflorum, Helenium.

The incidence of infection in some areas was extremely high. The virus was also found to be responsible for 100% infection of blue lupins, used as a green crop in the experimental nursery of the Snowy Mountains Authority at Cooma, and a case of 100% infection of broad beans was found in a rather isolated farm garden in the Oberon district (Central Tablelands).

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